Space Weather Forecast

Issued on Monday, 11 December 2023 at 00:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further isolated M-flares likely.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, with the peak flare at 10/0353 UTC from a region in the southwest, which is the most active region. It is nearing the southwest limb and is becoming increasingly difficult to analyse. Although significant magnetic complexity can no longer be seen, there have been recent alterations in the shape of the leading spot and the activity level suggests some complexity. A further region at north centre disc evolves slowly, with small changes in the numerous spots that occupy the intermediate part of the group, and with some magnetic complexity. In total there are currently nine sunspot regions on the disc, however all other regions are currently relatively small and simple at the present time.
No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were at background levels, with wind speeds around 350km/s. Total Interplanetary Magnetic Field was weak, while the north-south component also varied weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Low to Moderate activity is expected to continue, with a slightly decreasing likelihood of further isolated Moderate-class flares, predominately from the two more complex regions on the disc - one in the southwest and the other in the north-centre disc.

Solar Wind / Geomagnetic Activity: A weak CME may give a glancing impact early on Day 1 (11 Dec), but this is very low confidence. Otherwise, an enhancement to slightly elevated or perhaps elevated wind speeds from one of two coronal holes is possible during Day 1 (11 Dec), although these are difficult to observe so confidence remains low. A decline in wind speeds is then probable through Days 2-3 (12-13 Dec). A further coronal hole, which is a new feature for this rotation, is then likely to increase wind speeds once again sometime on Day 4 (14 Dec). Current Quiet geomagnetic activity may increase with the onset of any fast wind on Day 1 to become Unsettled with a risk of Active intervals, and a very slight chance of peak G1/Minor Storm conditions occurring. Activity then easing to become mainly Quiet once again, but with a similar increase in geomagnetic activity possible again on Day 4 with the onset of a further fast wind.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to remain at background levels with only a very slight chance of rising towards the S1/Minor Radiation Storm threshold should any significant flares occur from the two largest regions on the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	50	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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